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# SB1140 Performance Based Operating Funding Allocation
## Project Overview

Working Group Meeting

December 16, 2013

**PARSONS BRINCKERHOFF**

# Agenda

- Purpose & Objectives
- Role of Working Group
- Background
- Work Plan
- Schedule

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# Purpose & Objectives

- Advise Transit Service Delivery Advisory Committee (TSDAC) and Virginia Department of Rail and Public Transportation (DRPT) regarding transit operating grants allocation, including:
  - Data collection practices
  - Sizing of transit systems
  - Exceptional transit performance
  - Incorporation of other measures
    - Congestion mitigation and
    - Transit dependent outcomes

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# Role of Working Group

- Upon TSDAC's recommendation the Transit Agency Working Group is being convened as a steering committee.

- Provide input to DRPT, TSDAC on key policy questions related to operating grant allocation

- Discussion and critical feedback from all members welcome and encouraged

- Areas of consensus, agreement, and disagreement will be noted, but no formal votes by working group

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# Operating Allocation Model Phases

- **Phase 1: FY2014 mid-year allocation**
  - TSDAC Hybrid performance-based funding model
  - Used % change from two years of data (2011-2012) to measure performance

- **Phase 2: FY2015 allocation**
  - TSDAC Hybrid performance-based funding model
  - 2-year rolling average with three years of data (2011-2013) to measure performance

# Operating Allocation Model Phases (continued)

- ## Phase 3: FY2016 onward
  - Working Group studying the following inputs to the formula:
    - Data Collection Practices
    - Sizing Metrics
    - Exceptional Performance
    - Other Potential Measures
      - Congestion Mitigation
      - Transit Dependent Outcomes
  - 3-year rolling average using four years of data (2011-2014) to be used for trend analysis
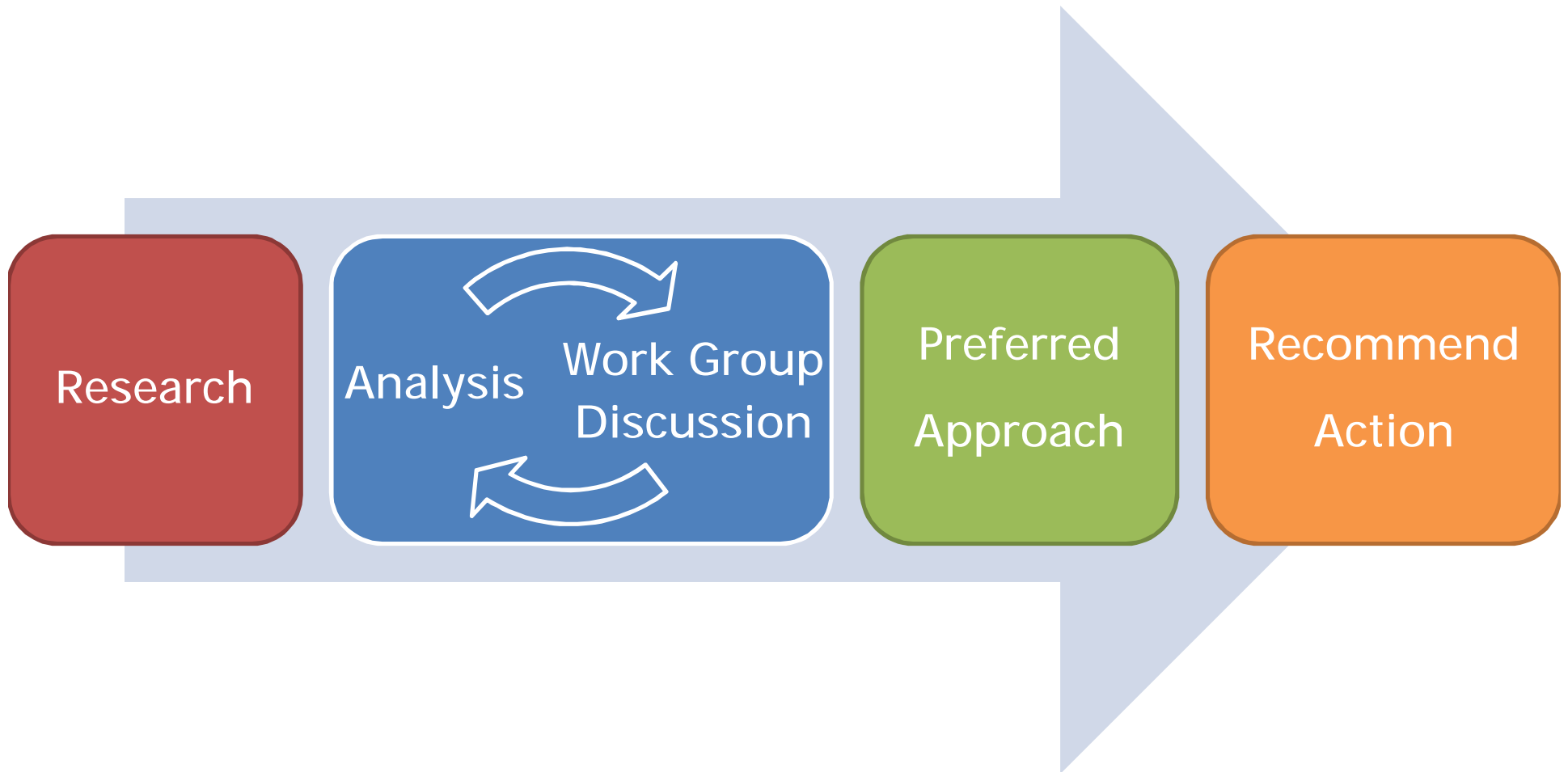
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# Work Plan

- Data Collection Practices Review
- Sizing of Transit Systems
- Exceptional Transit Performance
- Congestion Mitigation and Transit Dependent Outcomes/ Other Measures

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# General Approach

Research → Analysis / Work Group Discussion → Preferred Approach → Recommend Action

# Work Plan: Data Collection Practices

- Survey agencies regarding data collection practices
- Interview selection of agencies on data collection
- Evaluate data collection capabilities of OLGA
- Review transit industry practices in data collection and performance-based funding allocation
- Summarize findings on data collection methods, standards, and technology
- Select preferred data collection & reporting approach
- Finalize recommendations and develop standards

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# Work Plan: Sizing of Transit Systems

- Research best practices in sizing metrics
- Evaluate long list of potential sizing measures
- Develop short list of potential sizing measures
- Analyze impact of selected sizing measures on 5-6 operating funding allocation scenarios
- Select and summarize a preferred approach
- Finalize recommendations

# Work Plan: Exceptional Performance

- Research best practices in performance measures
- Discuss approaches appropriate for Virginia
- Evaluate 4 alternative approaches, including national benchmarking, under two scenarios
  - As part of overall operating funding formula
  - As second-tier funding for high-performance agencies
- Select and summarize a preferred approach
- Finalize recommendations

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# Work Plan: Other Potential Measures

- Evaluate data collection methods for congestion mitigation and transit dependent population

- Assess ability and appropriateness of incorporating these measures into funding allocation formula

- Finalize recommendations

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# Anticipated Schedule

| Task | Deliverable | Draft due | Final Due |
|------|-------------|-----------|-----------|
| Data Collection | Review Findings and Recommendations | 2/28/14 | 3/31/14 |
| | Proposed Data Collection Standards | 5/23/14 | 6/30/14 |
| Sizing of Transit Systems | Illustrative Funding Allocation with Sizing Transit System Metric | 1/31/14 | 3/31/14 |
| Exceptional Transit Performance | Illustrative Funding Allocation with Exceptional Transit Performance Metric | 2/28/14 | 3/31/14 |
| Other Outcomes | Recommendations and Technical Support Requirements for Other Outcomes Measures | 1/17/14 | 1/31/14 |
| Final FY16 Allocation | Funding Allocation Model | 5/15/14 | 6/30/14 |
| | Spreadsheet and Memorandum for FY16 and Beyond Allocation | | 10/15/14 |

# Working Group Meetings – Anticipated Schedule

- Meeting 1: December 16, 2013
- Meeting 2: mid-January 2014
- Meeting 3: mid-February 2014
- Meeting 4: mid-March 2014

# Project Overview

Questions & Discussion

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# Agenda

- **Operating Allocation Model**
  - Current model
  - Key characteristics
- **Refining the Operating Allocation Model**
  - Goals
  - Work plan
- **Initial findings**
  - Literature reviewed
  - How to use performance measures
  - Selecting a performance measurement approach
  - Key data challenges with performance measures

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# Phase 1 Operating Allocation Model

- Hybrid performance-based funding model:
  - Size-Weight Allocation:
    - Ridership (50%)
    - Operating Expenses (50%)
  - Performance Based Allocation:
    - Passenger per Revenue Hour (25%)
    - Passenger per Revenue Mile (25%)
    - Net Cost per Passenger (50%)

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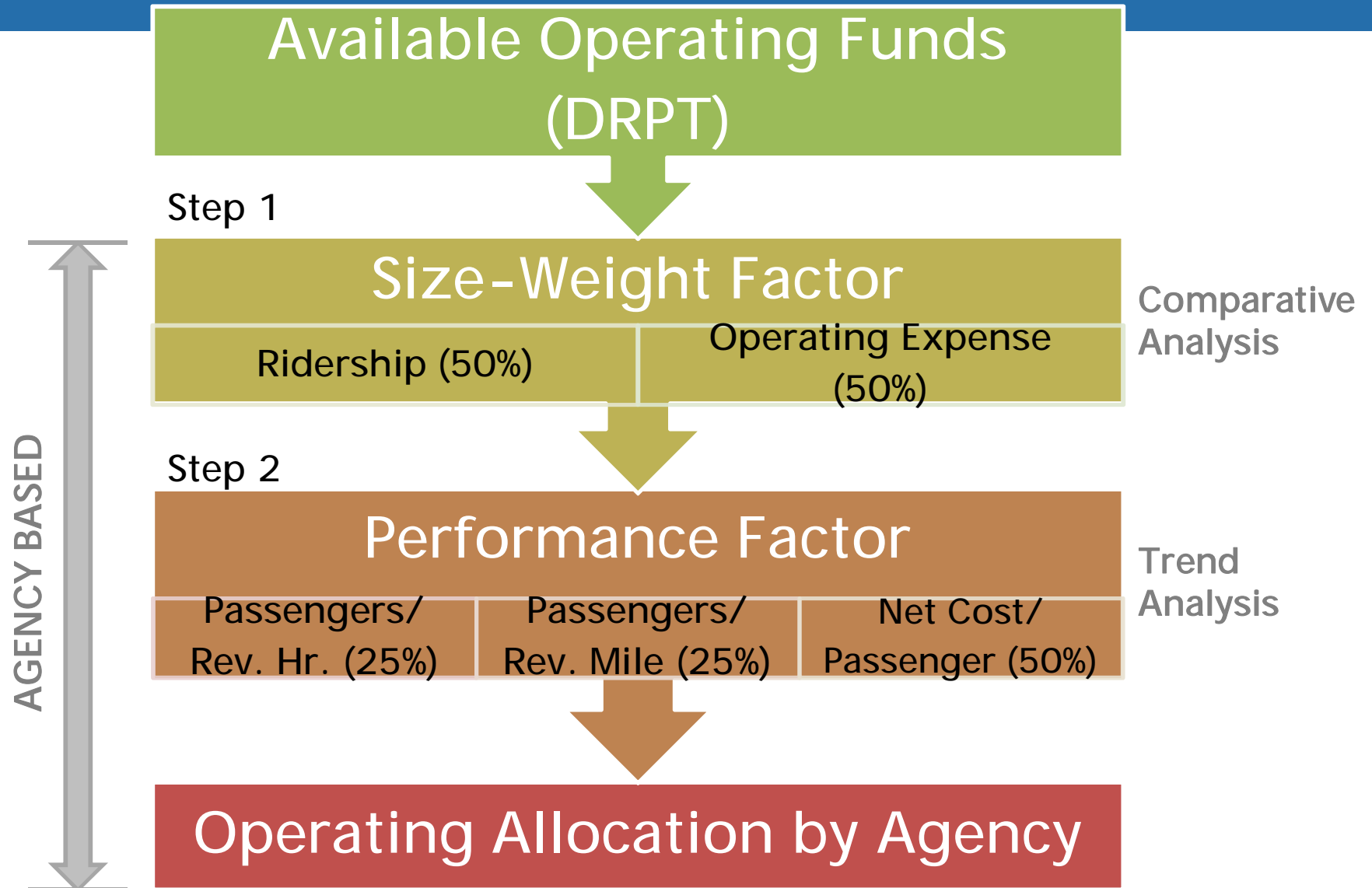# Phase 1:Operating Allocation Model continued

- Why hybrid performance-based?
  - Provides best elements of previous formula program
  - Provides stability (size-weight factor being a major determinant in allocation)
  - Rewards improved performance

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# Phase 1 Operating Allocation Model Key Characteristics

- **Size-Weight Allocation:**
  - Measures size relative to other Virginia agencies
  - Is primary determinant of Operating Allocation

- **Performance-Based Allocation:**
  - Measures year-over-year trend in performance of each agency
  - Rewards agencies for higher performance than statewide average
  - Penalizes agencies for lower performance than statewide average

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# Phase 1 Operating Allocation Model

**Available Operating Funds (DRPT)**

Step 1

**Size-Weight Factor**

| Ridership (50%) | Operating Expense (50%) |
|---|---|

Comparative Analysis

Step 2

**Performance Factor**

| Passengers/ Rev. Hr. (25%) | Passengers/ Rev. Mile (25%) | Net Cost/ Passenger (50%) |
|---|---|---|

Trend Analysis

**Operating Allocation by Agency**

AGENCY BASED
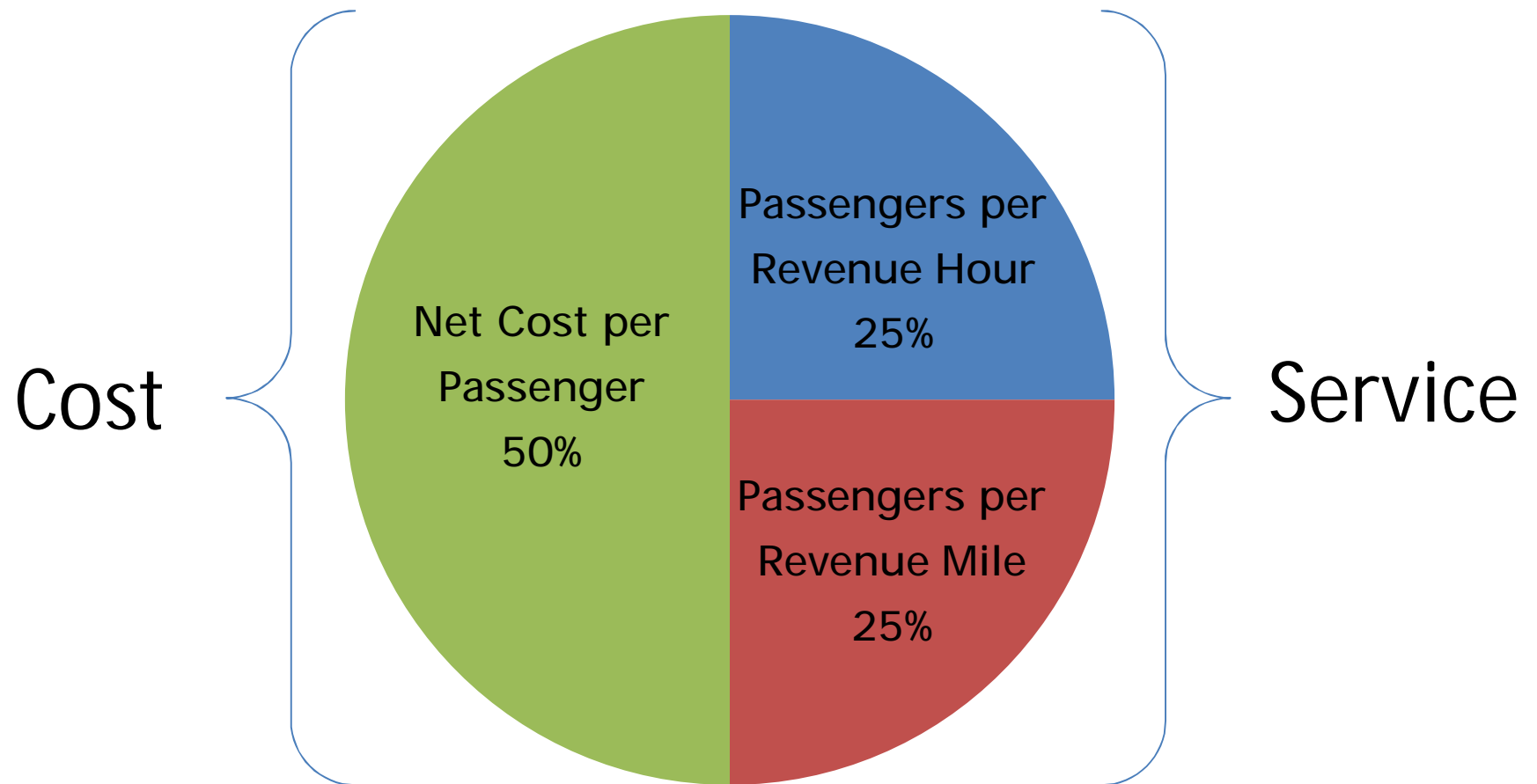
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# Funds Allocation Example

- $10 million in operating funding annually
- Three Agencies
  - **Metropolis:** Large urban agency providing rail, bus, and demand-response transit
  - **Capital City:** Medium urban agency providing bus and demand-response transit
  - **Smallville:** Small rural agency providing only demand-response transit

# Step 1: Size-Weight Factor

| Agency | Operating Cost | % | Unlinked Passenger Trips | % | Size-Weight |
|---|---|---|---|---|---|
| Metropolis | $200 million | 79.7% | 100 million | 90.87% | 85.3 |
| Capital City | $50 million | 19.9% | 10 million | 9.09% | 14.5 |
| Smallville | $1 million | 0.4% | 0.5 million | 0.05% | 0.2 |
| TOTAL | $251 million | 100% | 110.5 million | 100% | 100.0 |

- Allocation if based on size-weight factor:
  - **Metropolis:** $8.53 million
  - **Capital City:** $1.45 million
  - **Smallville:** $0.02 million

# Step 2: Performance Factors



Cost

Net Cost per Passenger 50%

Passengers per Revenue Hour 25%

Passengers per Revenue Mile 25%

Service

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# Step 2
## Factor 1: Passengers per Revenue Hour

| Agency | 2011 | 2012 | Trend Factor | Size-Performance Weight | Normalized Weight |
|---|---|---|---|---|---|
| Metropolis | 49.5 | 52.0 | 1.02 | 86.81 | 85.67 |
| Capital City | 17.1 | 17.4 | 0.99 | 14.32 | 14.13 |
| Smallville | 1.10 | 1.06 | 0.93 | 0.21 | 0.20 |
| WT. AVERAGE | 47.2 | 48.7 | 1.00 | 101.33 | 100.00 |

- Statewide weighted average growth is 3.2%
  - Metropolis growth 5.1%, better than average
  - Capital City growth is 1.9%, worse than average
  - Smallville decline is -4.2%, worse than average

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# Step 2
## Factor 2: Passengers per Revenue Mile

| Agency | 2011 | 2012 | Trend Factor | Size-Performance Weight | Normalized Weight |
|---|---|---|---|---|---|
| Metropolis | 3.25 | 3.30 | 1.00 | 85.35 | 85.37 |
| Capital City | 1.26 | 1.27 | 0.99 | 14.40 | 14.41 |
| Smallville | 0.063 | 0.065 | 1.01 | 0.22 | 0.22 |
| WT. AVERAGE | 3.12 | 3.17 | 1.00 | 99.97 | 100.00 |

- **Statewide weighted average growth is 1.6%**
  - Metropolis growth is 1.6%, equal to average
  - Capital City growth is 0.9%, worse than average
  - Smallville growth is 2.4%, better than average

# Step 2
## Factor 3: Net Cost per Passenger

| Agency | 2011 | 2012 | Trend Factor | Size-Performance Weight | Normalized Weight |
|---|---|---|---|---|---|
| Metropolis | $1.47 | $1.47 | 0.99 | 84.82 | 85.69 |
| Capital City | $2.58 | $2.67 | 0.96 | 13.95 | 14.09 |
| Smallville | $25.47 | $24.96 | 1.02 | 0.23 | 0.23 |
| WT. AVERAGE | $1.50 | $1.50 | 1.00 | 100.36 | 100.00 |

- Lower cost is better, so trend factor is inverted
- Statewide weighted average growth is 0.3%
  - Metropolis growth is 0.2%, better than average
  - Capital City growth is 3.7%, worse than average
  - Smallville growth is -2.0%, better than average

# Weighting

| Agency | Size Weight | Factor 1 Weight | Factor 2 Weight | Factor 3 Weight |
|---|---|---|---|---|
| Metropolis | 85.27 | 85.67 | 85.37 | 85.69 |
| Capital City | 14.50 | 14.13 | 14.41 | 14.09 |
| Smallville | 0.22 | 0.20 | 0.22 | 0.23 |
| TOTAL | 100.0 | 100.00 | 100.00 | 100.00 |

- To the extent factor weights are higher than size weight, grants will be higher and vice-versa

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# Funding (millions of dollars)

| Agency | Size-Weight Amount | Factor 1 Amount | Factor 2 Amount | Factor 3 Amount | Total Funding |
|---|---|---|---|---|---|
| Metropolis | $8.53 | $2.14 | $2.13 | $4.28 | $8.57 |
| Capital City | $1.45 | $0.35 | $0.36 | $0.70 | $1.42 |
| Smallville | $0.022 | $0.005 | $0.006 | $0.011 | $0.022 |
| TOTAL | $10.00 | $2.50 | $2.50 | $5.00 | $10.00 |

- Performance factors have small impact on grants
  - Metropolis receives $0.03 million more (+0.4%)
  - Capital City receives $0.03 million less (-2.0%)
  - Smallville grant is basically unchanged

# Goals in Refining Operating Allocation Model for Phase 3

- Maintain the hybrid performance-based allocation model developed in the Phase 1

- Implement:
  - Phase 3 data collection standards, methodology, and accountability recommendations
  - Recommended strategies for sizing of systems
  - Benchmarking of transit systems that have marginal room for performance improvement

- Recommend strategies and technical requirements for other measures as appropriate

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# Performance Metrics in Transit-Literature Reviewed

- TCRP 141: A Methodology for Performance Measurement and Peer Comparison in the Public Transportation Industry. 2010.

- Introducing Performance into Public Transportation Allocation Formulas, Cambridge Systematics. 2012.

- Senate Document #11, Performance-Based Funding Distribution for Public Transportation. 2011.

- TCRP 88: A Guidebook for Developing a Transit-Performance-Measurement System. 2002.

- RRD 361: State DOT Public Transportation Performance Measures: State of the Practice and Future Needs. 2011.

- TCRP Synthesis 56: Performance-Based Measures in Transit Fund Allocation. 2005.

# How to Use Performance Measures?

*"Taken by themselves Performance Measures provide data, but little in the way of context. To provide real value, measures need to be compared to something else to provide the context of "performance is good", "performance needs improvement", "performance is getting better"…."*

- TCRP 141, 2010

# Selecting a Performance Measurement Approach

- Select an approach and metrics that fit the goals
- Difficulty benchmarking among transit agencies to measure performance:
  - *"no two transit agencies are the same"*
- Ensuring that agencies have capacity to collect data on measures
- Minimizing complexity and ensuring transparency

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# Key Data Challenges with Performance Measurement

- ## Data Availability
  - Where will the data be sourced from?
  - What is the incremental burden of data collection and who bears it?

- ## Reliability, Consistency, and Currency of Data
  - Developing agreed-upon standards for core measures
  - Divergent data collection procedures
  - Obtaining consistent data on a regular basis over time
  - Can data be validated?

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# Principles of Transit Performance Measurement

- An agency's performance can be tracked over time and/or in relation to peers

- Measures can be refined by combining various characteristics to better achieve goals

# Potential Criteria for Selecting Performance Metrics

- Alignment with the **goals** of the effort
- A clear and **universal definition** of the metric
- Measurable given available tools and data and/or with minimal incremental **cost**
- Data collection **practices** that are **consistent** across agencies
- Ability to **easily update** the data on a periodic (annual) basis

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# Transit Data Performance Measurement Discussion Topics

- Does the hybrid approach include the appropriate weights for sizing vs. performance?

- Additional questions about how the current formula works?

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# Agenda

- **Data Collection Practices**

- Sizing of Transit Systems

- Other Possible Performance Measures & Grant Opportunities

  – Congestion Mitigation

  – Fulfillment of Transit Dependent Outcomes

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# Data Collection Practices

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# Literature Review Conclusions

- Data definitions, collection procedures, reporting, and accuracy are fundamental to successful performance measurement

- Inconsistencies in any of the above will create inaccuracies in the funding allocation model which may unfairly penalize or reward agencies

- Complexities arise when defining standards and procedures for diverse agencies

- Standards and procedural practices must be tailored to state transit program context

Data Collection Practices

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# Local Transit Agency Survey

- Survey designed to capture standards for collecting and reporting data among the DRPT agencies
  - Data source, collection and aggregation methodology for primary data collected by DRPT
  - Resources available to agencies for data collection
  - Data reporting outside of DRPT and OLGA
  - Issues with reporting in OLGA system

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# Local Transit Agency Survey

- Survey results will create a profile of data issues among Virginia agencies

- Survey distributed to **39** agencies on Nov. 22nd

- Received **28** responses to date; reminder sent on Dec. 9th

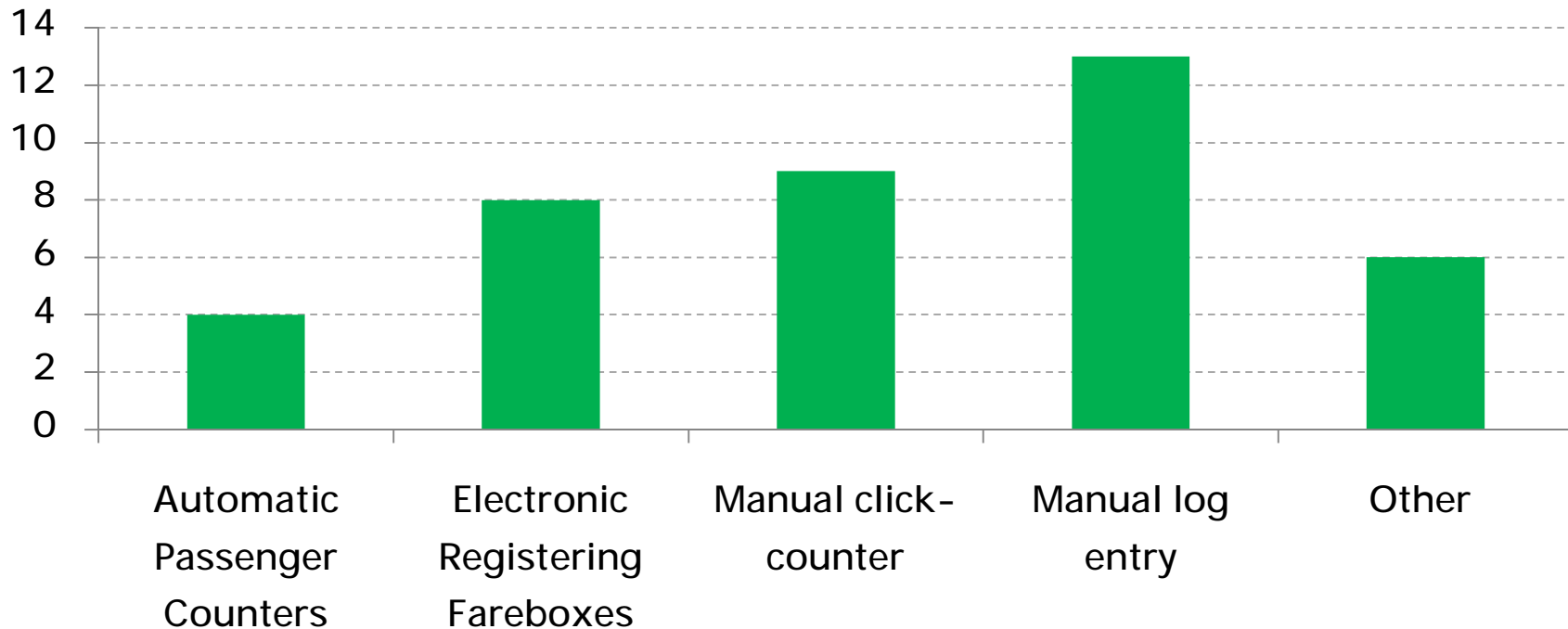- Interviews will provide more in-depth information

**Survey Response Rate as of Dec. 13th**



Yet to Respond 28%

Responded 72%

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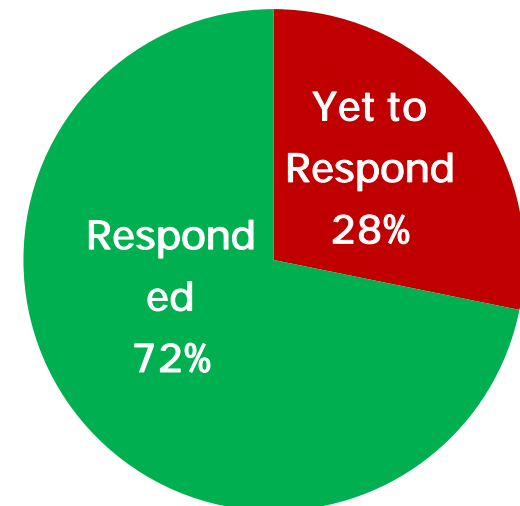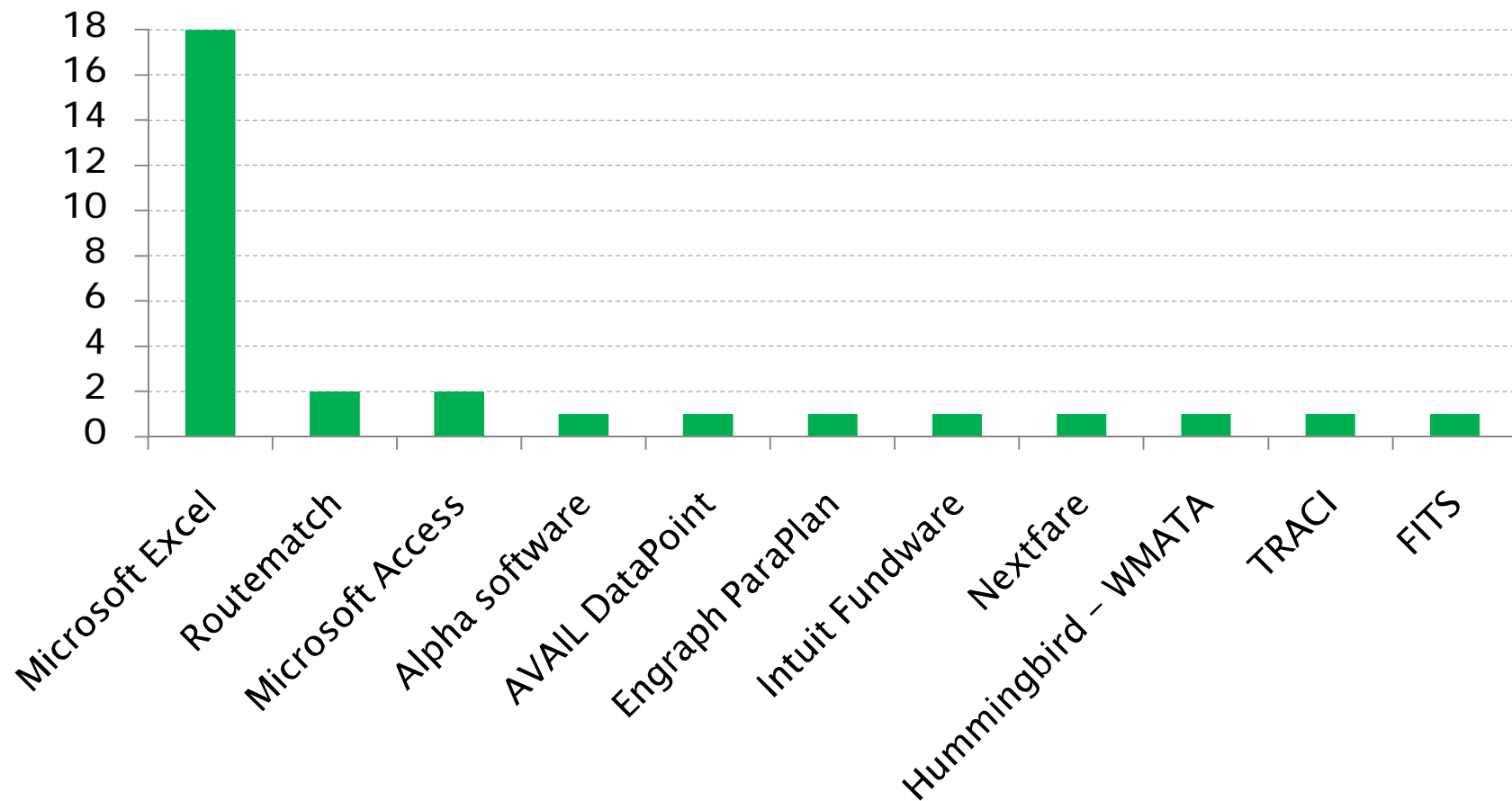
# Ridershp Data Collection Methods

- Respondents had the option of selecting all methods that apply
- 63% of agencies use one data collection method

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# Storage and Tracking Databases
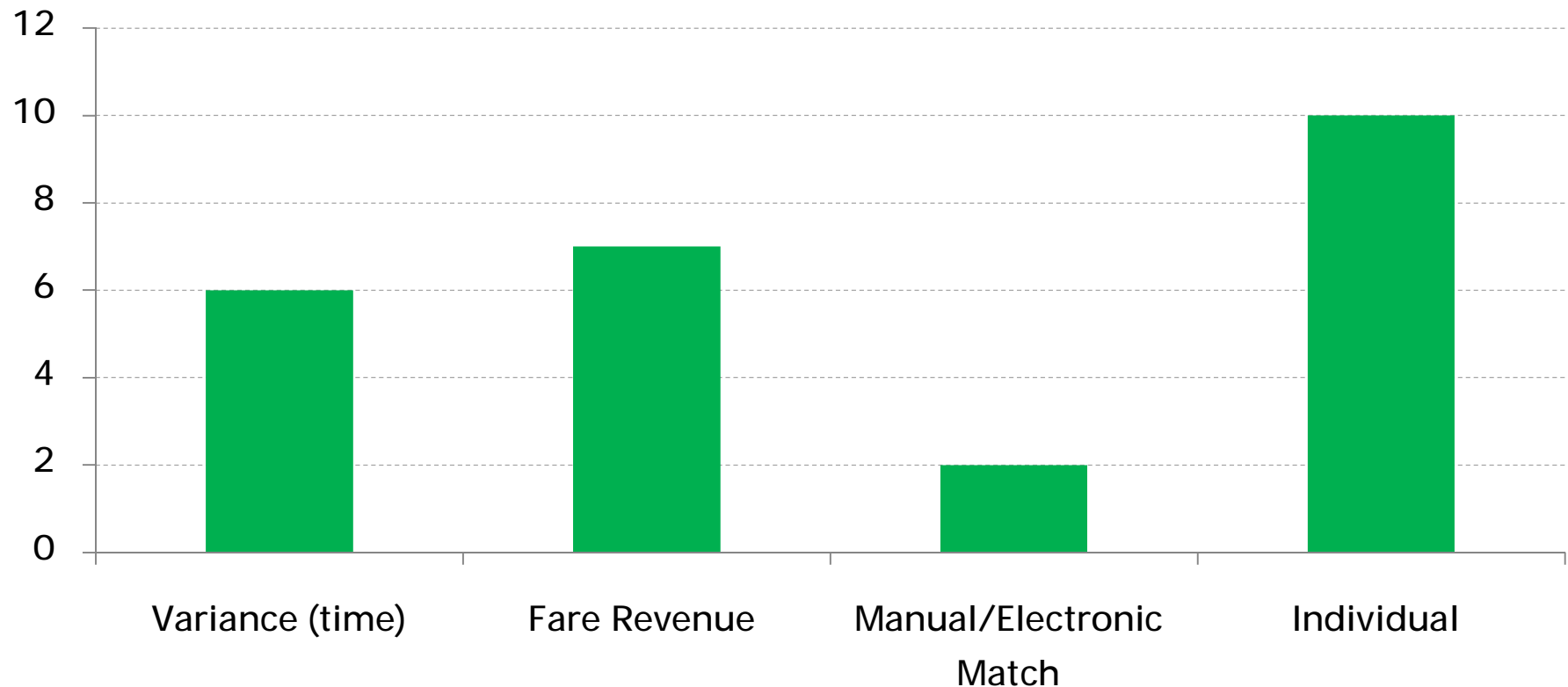
Survey Response Rate

Data Collection Practices

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# Data Verification Methods
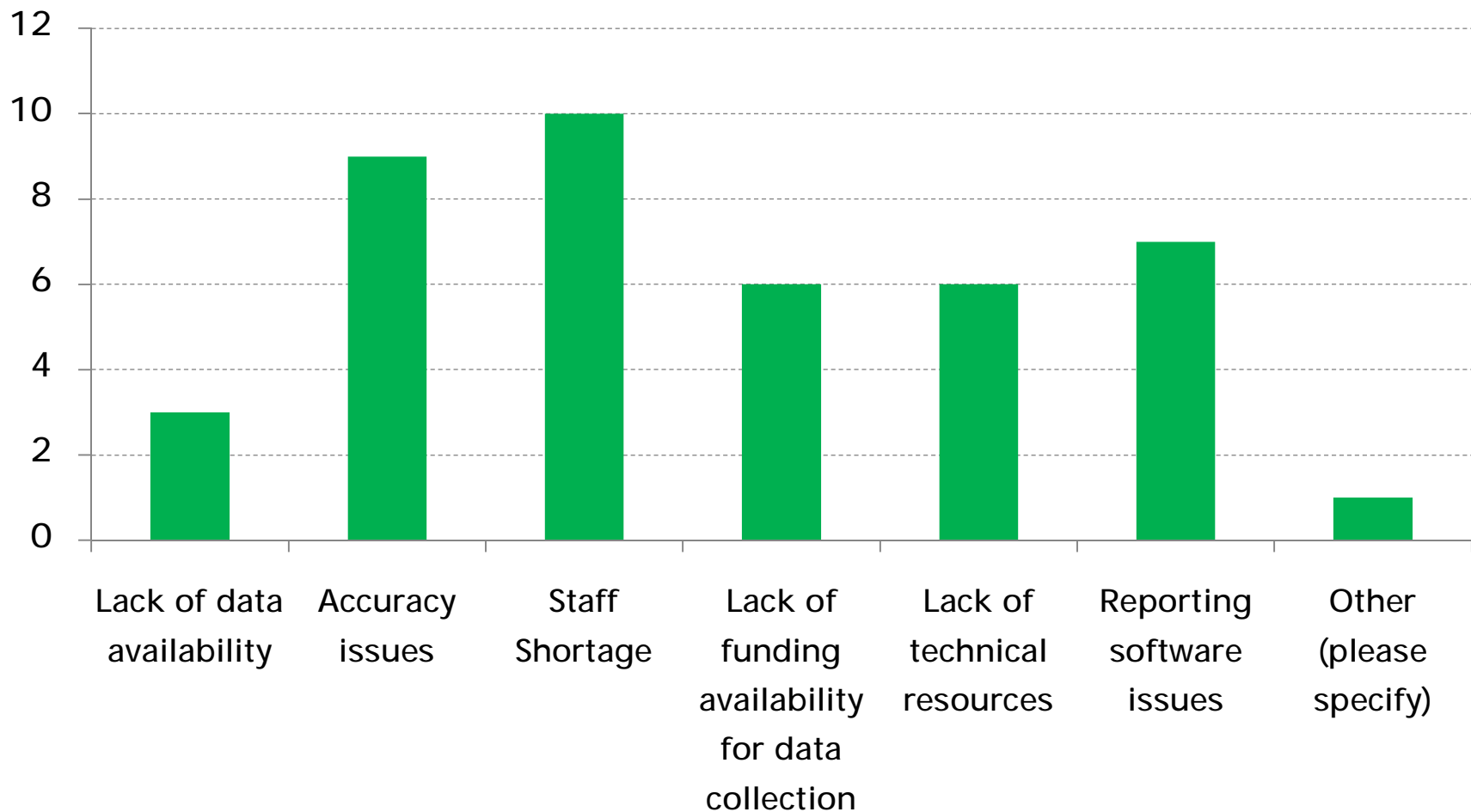
# Data Challenges

# Preliminary Survey Results

## Data Challenges (cont.)

- "Other" data challenge reported was differing DRPT and FTA reporting requirements leading to different data calculation methods

- Manual collection and entry errors most reported data accuracy issue. Additional issues include incomplete field data

- "Lack of staff with relevant experience" and "lack of funding for technical resources" most reported technical resource issues

- Average dedicated staff to data mgmt: 1.9; high of 10 (WMATA), low of .10

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# OLGA Experience



Scale of 1-5; 1= "easy, few issues", 5="difficult, lots of issues"
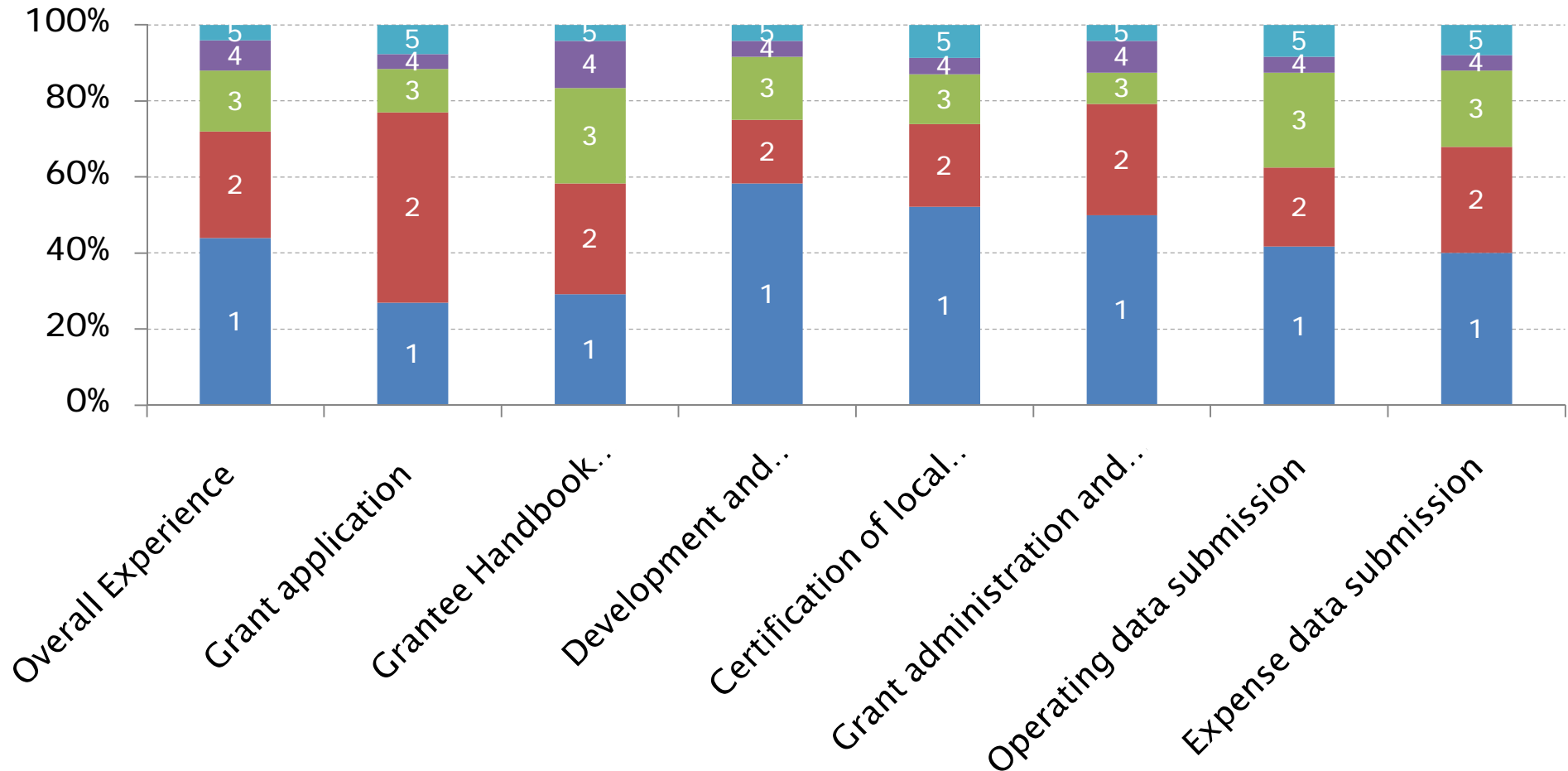
# Preliminary Survey Results

**Other Results:**

- 95% of respondents said they were able to report data on time to DRPT

  - One agency reported close annual audit deadline with end of fiscal year as obstacle

- 81% respondents had no difficulty with DRPT validating data

- 52% of respondents use an industry standard or benchmark

  - 73% use FTA or NTD reporting guides as standard

- Agencies also report data to FTA, NTD, APTA, local governments, stakeholder institutions (DOD, universities)

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# Preliminary Survey Results

**Other Results:**

- 48% of respondents collect data that track specific rider populations (transit dependent, etc.)

- 98% of respondents do not collect data on congestion mitigation

- In final open comments question, one agency asked for "best practices" data collection training for smaller agencies

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# Peer State Agencies

Parallel research of peer state agencies with experience in performance measurement:

- Pennsylvania scaled back performance-based allocation
  - *Why, and what was the experience with data collection and consistency?*
- Ohio revised allocation procedures for small and rural systems and urbanized areas
  - *What can be learned about data reporting requirements for a system of agencies with varying sized service areas?*

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# Peer State Agencies (continued)

- – North Carolina uses traditional performance measures efficiency, effectiveness, and productivity
  - *How has the state been successful in creating standards and accurately collecting data for these measures?*
- – Florida Transportation Information System is being used across the country for measures
- – New York and Kansas in process of performance-based allocation methods
  - *How does data collection and standards factor into the process of implementing the allocation model?*

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# Goals

- Survey and interviews with Virginia agencies will identify complexities with data collection among agencies of varying characteristics, capabilities, and resources

- Peer agency research/interviews will identify approaches to data collection and reporting

- Considerations:  Altering both data collection procedures on the agency-side and reporting requirements on the state side

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# Data Collection Practices: Questions and Discussion

- What are some of the biggest data collection issues currently faced in reporting to DRPT?

- Should the federal (NTD/FTA) and DRPT data requirements be made more consistent to standardize data collection processes?

- Should data collection practices be standard among all agencies?

- Other feedback on data collection issues?

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# Data Collection Practices: Questions and Discussion (continued)

- Would mandatory training sessions for transit operators and/or data management staff help to create consistency among agencies?

- Is it feasible to require consistent data management software among all public agencies (e.g., Excel template for smaller agencies, databases for larger agencies)?

- What issues should we drill into in subsequent interviews given preliminary survey results?

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# Agenda

- Data Collection Practices
- Sizing of Transit Systems
- Other Possible Performance Measures & Grant Opportunities
  - Congestion Mitigation
  - Fulfillment of Transit Dependent Outcomes

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# Sizing of Transit Systems

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# Size-Weight Formula Issues

- Current performance-based allocation formula applies Operating Cost and Unlinked Passenger Trips as size-weight factors

- Equal weight for both factors (50% each)

  – Does this incentivize a higher operating cost, regardless of system efficiency?

  – Are these the best two measures for determining relative size?

  – How might one or both measures be refined to improve the formula?

  – Should these factors have equal weight?

Sizing

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# Key Takeaways from Literature Review

- Ratios typically provide more information than simple metrics

  – Typically apply output measures as denominators: Operating expense per revenue hour (mile) versus operating expense

  – This type of ratio would only be valid to compare a modally homogenous group of systems

- NTD is a reliable standardized data source

  – Standardized data is key to cross-agency comparisons

Sizing

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# Key Takeaways from Literature Review (contd.)

- Sizing factors aim to rank agencies based on relative "size"
- Factors typically used for ranking agencies for peer grouping are ideal for assessing the size of a transit system
  - FTIS uses "likeness score" to rank agencies based on certain individual factors.
  - Factors used for estimating the likeness score can also be used to rank agencies by size

Sizing

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# Types of Input Measures to Consider for Sizing

- **Urban Area Characteristics**
  - Urban area population/size
  - Population density
  - Population growth rate

- **Service Area Characteristics**
  - Service area population/size
  - Service area type (e.g., service to entire region versus suburban service with links to CBD)

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# Types of Output Measures to Consider
## for Sizing

- **Transit Service Characteristics**
  - Miles of track
  - Number of stations
  - Annual vehicle miles (hours) operated
  - % service operated as fixed-route transit

- **Delivered Service Quality**
  - Service span
  - Revenue miles per urban square miles
  - Revenue miles (hours) per capital

# Screening Potential Sizing Measures

| Category | Metric | Data Source | Relevance to SB1140 goals (G/A/P) | Ease of data collection/ update (G/A/P) | Consistency of definition (G/A/P) | Comments/ Issues |
|---|---|---|---|---|---|---|
| Urban Area Characteristic | Urban area population | Census | A | G | G | Shows size and characteristics of the urban area served but with no relation to transit service provided. |
| | Urban area size | Census | A | G | G | |
| | Urban area population density | Census | A | G | G | |
| | Urban area population growth rate | Census | A | G | G | |
| Service Area Characteristics | Service area population | Census/ Agency | G | A | P | Links the user market to the service. However, there is lack of consistency in defining and measuring service area |
| | Service area size | Census/ Agency | G | A | P | |
| | Service area type | | A | A | A | |

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# Screening Potential Sizing Measures

| Category | Metric | Data Source | Relevance to SB1140 goals (G/A/P) | Ease of data collection/ update (G/A/P) | Consistency of definition (G/A/P) | Comments/ Issues |
|---|---|---|---|---|---|---|
| Transit Service Characteristics | Annual vehicle miles operated | Agency /NTD | G | G | A | Differentiate between rail and bus miles (hours)? |
| | Annual revenue hours operated | Agency /NTD | G | G | A | |
| | Peak Vehicles | Agency /NTD | G | G | G | |
| | Peak Vehicle Seats | Agency | A | P | P | |
| | Seat Miles | Agency | A | P | P | |
| Delivered Service Quality | Service span | NTD | A | A | P | |
| | Average system peak headway | NTD/ FTIS | A | A | P | |
| | Revenue miles per urban area sq. mile | NTD/ FTIS | A | G | P | Capture both service and urban area characteristics. High in complexity. |
| | Revenue miles (hours) per capita | NTD/FTIS | A | G | P | |

# Sizing Metrics: Questions and Discussion (continued)

- Does the metric lead to a bias toward certain types of agencies?

- Is there a consistent definition of the metric across agencies?

- Are the data available with minimal additional burden to collect and validate?

- If the data are to be collected from agencies, are the data collection and validation processes consistent across agencies?

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# Sizing Metrics: Questions and Discussion

- ## Should 'input' characteristics be considered?
  - Urban area population
  - Population density of the region served

- ## Should 'output' measures be considered?
  - Vehicle miles of service
  - Revenue hours operated

- ## Should coverage measures be considered?
  - Service span
  - Revenue miles per square mile of urban area

Sizing

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# Agenda

- Data Collection Practices
- Sizing of Transit Systems
- Other Possible Performance Metrics & Grant Opportunities
  - Congestion Mitigation
  - Fulfillment of Transit Dependent Needs

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# Why Discuss These More Specialized Categories Now?

- ## To determine:
  - Whether these goals should be incorporated into the operating funding allocation formula – OR –
  - If these goals are better served through a discretionary grant program

- ## To assess whether existing programs adequately address these goals

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# Agenda

- Data Collection Practices

- Sizing of Transit Systems

- Other Possible Performance Measures & Grant Opportunities
  - Congestion Mitigation
  - Fulfillment of Transit Dependent Outcomes

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# Congestion Mitigation

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# Potential Congestion Mitigation Measures in Literature

- **Land Use**
  - Percentage residents in transit supportive areas

- **Highways**
  - Annual delay per traveler
  - Freeway lane miles per capita
  - Trip Generation Measures
    - # of automobile trips eliminated
  - Change in automobile vehicle-miles traveled
    - Ability of transit to either eliminate trips or shorten them
    - Corridor analysis data may be required

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# Congestion Mitigation Is Being Considered in Assessing Capital Projects

- VDOT will apply congestion mitigation to evaluate significant transportation projects in Northern Virginia
  - Involves:
    - Developing highway and transit Measures of Effectiveness (MOE) by conducting peer review
    - Intensive Data Collection
    - Use of travel demand modeling and simulation
    - Quantifying the MOEs
  - Significant level of effort to prioritize, assess 25 NOVA area projects

# Congestion Mitigation Is Being Considered in Assessing Capital Projects (continued)

- **Metrolinx (Toronto) is updating metrics for evaluating transit capital extension projects**
  - Measures being considered:
    - Travel time savings
    - On-time performance (reliability)

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# Challenges with Incorporating Congestion Mitigation Measures

- ## Mitigation for whom?
  - Less crowded highways or less crowded transit vehicles?

- ## Congestion where?
  - In a corridor?
  - At intersections?
  - In a region?
  - In the agency's service area?

# Challenges with Incorporating Congestion Mitigation Measures (continued)

- Quantification requires significant data and complex tools (e.g., travel demand models)

  – Are such tools and data easily available to transit agencies?

- Since congestion is correlated with population density, does this measure automatically favor certain transit agencies?

  – Is congestion reduction redundant with other measures?

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# Addressing Congestion Mitigation

- Discussion
  - Should congestion mitigation be addressed as a goal of this project?
  - If so, what metrics appropriately capture this objective, and to how measurable is the data?
  - What other programs currently recognize congestion mitigation? Are they adequate?

# Agenda

- Data Collection Practices

- Sizing of Transit Systems

- Other Possible Performance Measures & Grant Opportunities

  - Congestion Mitigation
  - Fulfillment of Transit Dependent Outcomes

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# Fulfillment of Transit Dependent Needs

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# Potential Transit Dependent Population Measures

- **Demographics (applying Census data)**
  - % of households in service area without cars
  - % of population too young to drive
  - % of population in service area at poverty level
  - % of elderly/disabled population in service area

- **Coverage Measures**
  - Service area that covers the demographic groups above

- **Personal Economic Impact**
  - % of household income used for transit

Transit Dependent Population

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# Challenges with Incorporating Transit Dependent Service Measures

- Quantification requires access to demographic data and planning tools, such as GIS
  - Are such tools and data easily available to transit agencies?

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# Challenges with Incorporating Transit Dependent Service Measures (continued)

- Less effective routes (measured as $/passenger, service hour or mile) may constitute a greater proportion of service in rural areas
  - Does this favor certain transit agencies?
  - Should such a goal trump the general purpose of improving transit effectiveness and efficiency?
  - Are there better ways to recognize such service needs than incorporation in the base funding allocation?

Transit Dependent  Population

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# Addressing Fulfillment of Transit Dependent Needs

- Discussion
  - Should fulfillment of transit dependent needs be addressed as a goal of this project?
  - If so, what metrics appropriately capture this objective, and to how measurable is the data?

Transit Dependent Population

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